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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/584,769	06/01/2000	Tomoya Nishibata	P107344-00001	5361

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EXAMINER

JOYCE, WILLIAM C

ART UNIT PAPER NUMBER

3682

DATE MAILED: 12/13/2001

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/584,769

Applicant(s)

NISHIBATA ET AL.

Examiner

William C. Joyce

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 28 September 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-23 is/are pending in the application.
- 4a) Of the above claim(s) 4,6,8 and 10-22 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-3,5,7,9 and 23 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 01 June 2000 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

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DETAILED ACTION

This is the first office action on the merits with reference to the above identified patent application filed on June 1, 2000.

Election/Restrictions

1. Applicant's election with traverse of Group I in Paper No. 4 is acknowledged. The traversal is on the ground(s) that the subject matter of Groups II, III, IV, VI and VII are so closely related that they should be examined with Group I, and that the subject matter of all claims is sufficiently related that a through search for the subject matter of any one group of claims would necessarily encompass a search of the subject matter of the remaining claims. This is not found persuasive because the species of Groups II, III, IV, VI, and VII are patentably distinct species as compared to the species of Group I. For example, the species of Group I does not disclose: a rolling ball (31) used in combination with a conical roller as illustrated in Group II, the holding plate (23) of Group III, and the swirl pins (50) of Group V. Further, each species show a separate inventive effort by the inventor and therefore defines diverging subject matter. The examination of the diverging subject matter of the entire application is considered to be a serious burden to the examiner even though the diverging subject matter has the same classification.

The requirement is still deemed proper and is therefore made FINAL.

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2. Claims 4, 6, 8, and 10-22 are withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to a nonelected species, there being no allowable generic or linking claim. Applicant timely traversed the restriction (election) requirement in Paper No. 4. Applicants' correspondence filed September 28, 2001 defines claims 4 and 6 as reading on the elected species, but examiner notes that the species of Figures 1-5 does not show the limitations "the load applied to the conical surfaces of the both-end conical rollers is set to be biased to the larger diameter side of the conical surfaces" (claim 4) or "a clearance for avoiding interference with the inside of the track pockets is provided in the bounded bottom of the both-end conical rollers" (claim 6). For example, claim 6 appears to be directed to the species shown in Figure 23 and not the elected species. Accordingly, claims 4 and 6 have been withdrawn as being directed to a nonelected species.

Priority

3. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Drawings

4. Figure 28 (a-b) should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid

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abandonment of the application. The objection to the drawings will not be held in abeyance.

5. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the "crowning" (claim 3) must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 112

6. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

7. Claims 1-3, 5, 7, 9, and 23 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

a. Claim 1, lines 6-7, the limitations "the scroll swirl radius" and "the dimension" lack proper antecedent basis. Examiner suggests changing the limitations to --a scroll swirl radius-- and --a dimension--.

b. Claim 2, line 6, the limitation "the generator direction" lacks proper antecedent basis.

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c. Claim 2, lines 6-8, the limitation "the contact length in the generator direction of the both conical surfaces to the track on the both bearing plates is set to be as small as possible" is unclear as to what applicant considers "as small as possible." Theoretically, the rollers can be configured to have an infinitely small contact length with the tracks, such as point contact, however the rollers would not be shaped as cones. Applicant must amend the limitation to clearly define the metes and bounds of the desired patent protection.

d. The wording of claim 7 is awkwardly worded making the limitations unclear. For example, some awkwardly worded limitations are: "a pair of linking pins fixed to the both bearing plates" (lines 2-3), "this linking pin has an engaging flange" (lines 3-4), and "each opposite side bearing plate" (line 8). Is applicant claiming that each plate has a pair of linking pins or that each plate has at least one linking pin.

Claim Rejections - 35 USC § 102

8. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

9. Claim 1 is rejected under 35 U.S.C. 102(b) as being anticipated by Rood (US Patent 4,715,733).

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Rood discloses a thrust bearing arrangement in Figure 10 configured for orbital motion, the thrust bearing comprising a pair of opposing plates (20e,22e), a track pocket (32) formed in the plates, and a plurality of both end conical rollers (24a) disposed in the track pockets of the opposing plates. Referring to Figure 10, Rood illustrates the relation of the scroll swirl radius and the dimension between opposite tracks of the bearing plates is set in a relation of $1 < H/R < 5$.

Claim Rejections - 35 USC § 103

10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

11. Claims 3, 5, 7, 9, and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rood (US Patent 4,715,733) as applied to claim 1 above, and further in view of Tanishiki (US Patent 5,846,000).

With respect to claim 3, Rood does not disclose the rollers having a crown, but Tanishiki discloses (column 11, lines 1-6) that the rollers can be formed with a crown. It would have been obvious to one of ordinary skill in the art at the time the invention was made to form the contact surface of each roller disclosed by Rood with a crown, as taught by Tanishiki, in order to reduce edge loading thereby increasing the operating life of the rollers.

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Rood does not appear to show the claimed linking members and positioning parts. Tanishiki teach a roller bearing assembly having linking members (10,11) configured to link opposing plates and positioning parts (20,21) which can engage a swirl unit. It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the bearing arrangement of Rood with linking members, and positioning parts, as taught by Tanishiki, in order to facilitate the assembly of the bearing arrangement into a swirl unit.

With respect to claim 9, Rood illustrates the track pocket having an inside diameter as the swirl circle of the both-end conical roller, the inner sides of the opposing pair of track pockets are disposed in an eccentric state by the portion of the radius of the swirl circle of the both-end conical roller mutually in a plane view, and the both-end conical rollers are guided and held in nearly elliptical holding holes formed by overlaying these inner sides.

12. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Rood (US Patent 4,715,733) as applied to claim 1 above, and further in view of Tsutsui et al. (US Patent 5,752,775).

Rood does not disclose a junction surface including a continuous arc section connecting the conical surfaces, but it was known in the art to provide a continuous arcuate section between two adjacent surfaces of a rolling bearing in order to reduce edge loading of the rolling element. For example, Tsutsui et al. illustrates in Figure 1(b) a rolling element (3) having a first surface (3a) connected to a second surface (3b) by a

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continuous arcuate section (Rb). Referring to the specification (column 2, lines 44+), Tsutsui et al. discloses that the arcuate section of the roller is used to eliminate the stress concentrations of the edges of the rollers in order to prolong their life and improve the quality of the rollers and to simplify the processing steps. It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the rolling elements disclosed by Rood with a continuous arcuate section connecting adjacent surfaces, as taught by Tsutsui et al., in order to reduce edge loading thereby prolonging the operating life of the rolling element.

Conclusion

13. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

-Note the scroll bearing arrangements of Wagner (US Patent 419,089), Yano (US Patent 6,123,605), Ueda (US Patent 6,152,712), and Japanese Reference (2001-82489).


-Note the crowning of a rolling element disclosed by Fernlund (US Patent 3,740,108).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to William C. Joyce whose telephone number is (703) 305-5114. The examiner can normally be reached on Monday - Thursday 7:30-5:00.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Bucci can be reached on (703) 308-3668. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 305-7687 for regular communications and (703) 305-7687 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-1113.


William C. Joyce
December 10, 2001